...this brew has been cooking for years!

ADHD Revisited: A whimsical review

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The Editor

Late in the 19th century a behavior disorder, with or without hyperactivity, was labeled as a brain-damage syndrome, the result of a central nervous system infection, a head injury, or brain insults.

Then in the period 1930 to 1940, there arose the idea that this syndrome in itself could be secondary to brain damage.

In the 1960s, the syndrome of Attention Deficit Hyperactivity Disorder (ADHD) without accompanying brain damage was considered and labeled as Minimal Brain Damage. *It appears that the stigma of* brain damage *never left the picture.*

In 1968, Learning Disability finally was separated from ADHD, although the entire syndrome ADHD/LD exists rather commonly.

Over the years the proportion of boys to girls decreased from 8:1 to 5:1.

All physicians, regardless of specialty or subspecialty, are familiar with the use of stimulants in the multidisciplinary approach to ADHD. Methylphenidate and dextroamphetamine continue to be of value, with methylphenidate in the forefront and pemoline a distant third.

Seventeen side effects, many of them transient or dosage affected, have been attributed to methylphenidate. In one report the author does his best to repudiate most of them. Physicians familiar with the drug are cognizant of many of these and the relative transience of most.

The recommended provisional dosage of methylphenidate is to begin with 0.3 mgm/k b.i.d. and increase to 0.8 to 1.0 mgm/K b.i.d. Dosages in excess of 1.0 mgm can increase symptoms and side-effects. Occasionally a t.i.d. regimen may be indicated. Older children can tolerate 40 to 60 mgm a day.

It is interesting to note that in England methylphenidate is not prescribed. This may not be true at present, however.

Dextroamphetamine can, as a rule of thumb, be beneficial at one-half the suggested strength of methylphenidate. Children 3 to 5 years old can start with 2.5 mgm daily with the dose if needed, increased by 2.5 mgm daily each week. Children 6 and older may start with 5 mgm per day; the daily dose can be increased step-wise by 5 mgm if needed.

Cylert (pemoline) chewable tablets are available in 3 strengths: 18.75, 37.5 and 75 mgm. Treatment is begun with 37.5 mgm and, at one week intervals, gradually increased by 18.75 mgm. The maximum advocated dose is 112.5 mgm; however, such a dosage would be for older children. Periodic monitoring of the hepatic profile is recommended.

The use of methylphenidate in the usual b.i.d. dosage has been reported to result in a "window" of increased cognizance of but one to 3 hours after ingestion. This can result in a therapeutic dip. Therefore, perhaps Methylphenidate SR-20 (the equivalent of 10 mgm b.i.d.) could be preferable from 2 standpoints: only 1 a.m. dose with an effect coming on 2 hours after ingestion and lasting about 9 hours. This is in accordance with one report.

This same study relates the equivalency of Methylphenidate SR-20, Dextroamphetamine spansules-10 (to be swallowed whole), and Cylert. There is some evidence that dextroamphetamine, compared to methylphenidate, may result in more side effects.

Current information from the American Psychiatric Association on the treatment of psychiatric disorders cites the pharmaceutical treatment of ADHD as follows: After 2 weeks of maximum dosage of dextroamphetamine and then methylphenidate or 5 weeks of pemoline without demonstrable benefit, cessation of therapy is recommended. Then their choice would be a tricyclic antidepressant, namely imimpramine or desipramine at a dosage of less than 5 mcgm/k/day (usually about 100 mgm/day in divided doses). Cardiac monitoring is essential with this regimen.

Clonidine has been used with some success at an oral dose of 5 mcgm/k/day; q.i.d. blood pressure must be monitored. The same APA *Bulletin* stresses the vast importance of the multimode treatment, including all disciplines likely to be involved.

Imimpramine and despramine follow identical metabolic pathways. The use of imimpramine for night enuresis seems to have fallen into disfavor. As an antidepressant, it should be reserved for adolescents aged 18 and above. In any case, it may be wise to limit its use on children ages 5 or 6 or older. Its use in prepubescent children is contraindicated because of suspected possible permanent defects in cardiac conduction systems.

According to the author of *Pediatric Notes*, certainly imimipramine and one of the stimulants should not be used concomitantly. Recently, the 1975 ogre of Sudden Infant Death secondary to imimiprimine was refuted. Contrarily, a report claimed more or less the opposite.

Hard on the increase in use of stimulants in treating ADHD was the appearance of much criticism, especially from the Church of Scientology with its Citizens' Commission for Civil Rights. Threatened suits against some 600 physicians appeared, claiming use of "clinical billy clubs and straitjackets"; claiming that prescribed stimulants resulted in murder, suicide and drug-abuse.

Today remnants of these vociferous claims are found in

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the emphasis on natural, herbal or nutritional remedies; on the close inspection of every supermarket item for the presence of food additives or supplements. This approach to ADHD has its place, but in a proper perspective.

Drug therapy is one arm of the needed multidisciplinary approach to the diagnosis of ADHD with or without LD. The child's school provides the cornerstone of the locus. The Connor scale used in the classroom for rating a pre-school or elementary student as having a probable ADHD is an excellent determinant. It is preferable for this be used twice and by 2 separate teachers. Then the child should be tested psychologically, and thoroughly so. Needed is a consultation with the primary physician regarding past and present medical history, pertinent family history and whether medication is needed and when.

A social worker is a vital fourth arm of the team in evaluating home and social environs. It would not be unusual for a child to be labeled with ADHD when, in truth, his class behavior and inattention comprise a pseudo-ADHD, totally secondary to a deplorable, devastating family and social environment.

At this point, perhaps a loose recital of my impressions may be practical in terms of the etiology of ADHD, with or without learning disability, although oftentimes the two are aligned, eg, ADHD/LD:

(1) **Inborn:** In adults observed with ADHD, according to one study, each had at least one child with ADHD. One report suggests that of 20 children with persistent ADHD, 2, when adult, will continue to ride in the saddle of ADHD.

(2) **Family Environment:** Psychosis must be excluded. Subclinical Tourette's disease should also be differentiated. The most common family/social degrading influences hysteria, alcoholism, drug abuse, child and/or spouse abuse, including sexual and parental indifference.

(3) **Neurological:** One must differentiate ADHD from post-encephalitis, personality change as an indicator of organic brain disease, subclinical epilepsy and hypothyroidism (now routinely checked at birth).

(4) **Toxins:**

a. Lead poisoning is high in the top 10 on the toxicology list despite illegal lead-based paint and the marked decrease in the use of leaded gasoline. Old houses painted with a lead base still stand.

A recent report suggests that toddlers with foreign bodies in the nose, ears or the gastrointestinal tract are much more apt to indulge in pica which, in turn, occurs more in low-income families; who, in turn, are more often apt to live in houses that have had lead-based paint only partially removed.

If children with significant lead in their blood have a routine flat plate of the abdomen taken, radio opaque flakes of lead are apt to be seen.

In summary, 16% of American children have lead levels in the neurotoxic range. Significant exposure to lead affects intelligence, neurologic behavior and cognitive function. It has been said that lead toxicity can be found with levels as low as 10mcgm/L. In screening for levels, it is suggested that if lead levels between 10 and 40 are found, the tests should be repeated every 3 weeks until the levels come down to below 10 mcgm/L.

Chelating agents for laundering lead levels such as

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EDTA are expensive and time consuming. It is still uncertain if they are of true, lasting benefit. Penicillamine also is used, but its long-term effect still is unknown. A new oral-chelating agent, Succiner, is awaiting favorable or unfavorable reports. In the present high-tech age, when lead levels are less than 25 mcgm/L, no beneficial treatment seems to be on the therapeutic horizon.

Treating lead poisoning is not the answer. Eliminating the sources of the toxin is the obvious task. At present, lead-contaminated dust and water are the principal agents. Old lead-paint-contaminated houses in low-income areas are a not-too-distant third. It seems clear that lead-poisoning lurks at all levels of childhood society and even the affluent no longer can be secure.

Modern medicine routinely requires newborns to be tested for PKU (a rare disease) and for thyroid metabolic function. We check for sickle-cell disease, the thallasemias, and do routine hematocrits; and yet, we ignore routine screening for lead-levels.

(b) **Fetal Alcohol Syndrome** may lead to ADHD/LD. Fetal exposure to drug abuse, especially cocaine may have a permanent effect as yet not clear, but may be extrapolated to permanent CNS damage.

(5) **Anemia:** Lassitude and inattention are the result, generating learning disability. Rarely is there hyperactivity unless in aggressive response to scolding by parent or teacher.

(6) **Sensory Disorders:** Decreased hearing and vision can be detected in compulsory school physicals.

(7) **Allergies:** Food substances and additives have their strong and their mild advocates. There seems to be little doubt that the elimination of certain foods and food additives can result in a diminishing of substantive effects of ADHD.

Several years ago, Dr. Feingold studied food allergies relevant to ADHD. There are 20 *guilty* foods on his list, plus all food additives, chocolates, toothpaste, and all medications containing salicylic acid.

Adherents to the regime profess success. There is the majority who include allergies as part and parcel of the whole. It would seem proper to suggest that there are varying degrees of ADHD, with or without LD, just as there are varying degrees of Down's syndrome and other entities. Perhaps that is why different regimens of treatment for ADHD, with or without LD, have their start and at times nearly stubborn supporters.

(8) **Maturational Lag:** Very mild cerebral palsy, or a delay in most physical and learning aspects, some of which can be caught up in the early future, can be detected. The pediatrician's growth chart is a needed adjunct to diagnosis and treatment.

(9) **Psychoneurosis:** A good and complete psychological exam is an absolute. Consider subliminal autism. Consider subclinical Tourette's disease such as persistent pre-treatment tic, especially if a parent has the same nervous sign. Lastly, suspicion of a latent psychosis should always be on the examiner's mind, especially if a psychosis is in the family history. There are markers in early onset of childhood schizophrenia; that stigma is a rarity in pediatrics.

(10) **Mild Mental Retardation:** Hyperactivity may be secondary to this syndrome. Here lies the necessity of early and frequent check-ups by the pediatrician and careful observation by the teacher to establish ADHD/LD on this basis.

Laboratory Diagnosis

(1) **EEG** is actually non-informative unless subclinical epilepsy is suspected.

(2) **CAT SCAN** may show mild cerebral atrophy or reversal of right/left asymmetry. Again, it is equivocal.

(3) **PET** Radioactive glucose was tagged and injected into a cerebral artery in 25 young adults diagnosed as having ADHD. Compared with controls, a statistically significant 8.1% disease in cell uptake of glucose was noted in 3 cerebral areas. These regions affect attention, motor activity and control of automatic responses to certain sensory stimuli, such as hearing, smell and feeling. A few of the sensory changes can be slightly mindful of autism. This experiment probably will be or has been repeated. Other compounds will be tested in this manner. The implications are exciting.

Called to mind is the *old formula* for hyperactivity: 4 tablespoons of powdered glucose a day in divided doses. In deference to whole-body metabolism, it may be judicial to increase considerably the carbohydrate intake.

Now for the bad news

It is thought that if the signs and symptoms of ADHD, with or without LD, persist beyond the age of 8, the syndrome may well persist into adolescence despite treatment and counseling. In the higher grades, unfortunately, few of these adolescents are being treated in any way. If methylphenidate is to be tried, and if there is good compliance, 80 mgm a day can be tolerated.

The statistics: 20% of elementary and intermediate school children with ADHD may be symptom-free when they enter adolescence. Interestingly and comparable to the rule of thumb in allergy: If a child's allergy symptoms persist beyond the age of 13, he will probably have some allergy symptoms on into adulthood. Desensitization in childhood may effect a moderation of this tendency. So it might be with ADHD.

Of the remaining 80% of young people with ADHD (especially with LD), some 30% are destined to be loners, subject to the devious paths taken by those with that syndrome. And of that remaining 80%, 50% are or will be on the road to antisocial behavior. Fifty percent will still demonstrate some learning disability and in these two 50-percentiles, hyperactivity will be persistent, with all its impulsivity, aggressiveness and consequent anger.

If an ADHD youth with antisocial conduct and aggressiveness, combined with impulsivity and abetted by drugs and alcohol, has a gun in his or her hand, what may be anticipated? In 1990 to 1991, the main cause of death in males aged approximately 17 to 22 was murder.

In adults some ADHD symptoms persist to a greater degree, some to a lesser. Old learning disabilities proportionately persist. One ponders this: How many ADHD-persistent adults, men and women, inhabit our prisons, which are bulging at the seams?

Impulsive aggressiveness, properly guided by professional counselors and with continued pharmaceutical treatment, can with effort be turned around 180 degrees. Aggressiveness even in the medical profession can be sublimated, eg from surgery to *fighting* disease; or in community work, such as *fighting for a cause* (crowds of abortion and civil rights demonstrators are a

sum-total of individual aggravations). Firefighters, some athletes, law enforcement officers (incidents of police abuse probably are an overdrive effect—a reason, but not an excuse) manifest this sublimation.

Imprinted on the reverse side of the coin is conscienceless criminality, hand in hand with unrestraint and bloodshed. In this subpopulation, humanism becomes an irritating ghost.

There are subjective signs and symptoms resultant from the ADHD syndrome with or without LD. However, it is unfortunate that often hidden signs and symptoms of the ADHD syndrome are not included or are not noted, or are misunderstood, both by parents and teachers. These traits appear early in elementary school, often regardless of multidisciplinary treatment. These warning signs include:

(1) **Sensitivity.** I would venture that nearly every ADHD child is very sensitive to the actions and words of peers and adults.

(2) **Guilt.** "Why do I have to take medicine and get all these tests?" "Something must be wrong with me, but what?" "No matter what I do, things don't come out right!" Guilt is the parent of strenuous self-criticism.

(3) **Guilt** and sensitivity breed the ogre of low self-esteem. Trying desperately to live up to expectations of others is unsuccessful because the harder he or she tries, the more he or she gets in his or her own way, making one error, one blunder after another.

(5) **Feeling unworthy** of any praise or even of being loved.

(6) **Depression** is manifested by a loner, plagued by ADHD, with or without LD, who remains in the land of in-between, not antisocial, but longing for the greener grass. Or by a loner, plagued by ADHD/LD (very likely) who chooses the road of impulsive aggressiveness in adolescence. "I can belong to something; people (the gang) accept me." The loner becomes a *belonger*, drifting into alcohol and drug abuse. Again, humanism has been lost[14].

(7) **Subjective poor concentration.** This is distinct from extraneous intrusion. Oftentimes subconsciously, the child's mind wanders into foreign fields while trying to focus on his or her lesson. This mental meandering is to be accepted for what it is, before some type of corrective therapy is attempted. On the other hand, the ADHD child can *lock onto* a television cartoon and will resist interruption. This inconsistency can apply to any subject or person he or she finds of intense interest. Concerned adults have difficulty accepting this incongruit: "If he can concentrate on cartoons, then he can concentrate on his homework!"

Many of these ADHD children possess a credible degree of intelligence, although hampered by a learning disability. An IQ test given by one observer can be misleading. There are too many variants—subjective and objective. The child deserves one or more testings offered by separate professionals. I have noted a deep mental keenness in several ADHD children. If this be so, and if a child finds a certain object to be of intense interest to him or her, one he or she can lock onto, take apart and reassemble, could not his early education be centered on this inherent ability? His or her learning could expand from this base, thus encouraging his or her searching for associated topics or objects.

ADHD, with or without LD, if considered early-on (1% to 5% demonstrate signs and symptoms before elementary

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school age); and, if properly treated with medication and frequent follow-ups and conferences throughout the schooling years (if that be at all possible); and, if these disciplines persist through intermediate and high school; some of these children and adolescents could be salvaged.

It appears to me that the sad record of ADHD, treated or not, in adolescents and young adults could in part be laid at the feet of inconsistent, multidisciplinary checks and *check again.* Unfortunately the early treatment teams cannot track these individuals into and through their teens.

Much — so much — remains to be done. Elementary school reports on ADHD children with or without LD are in confidential files. Some records follow the child into intermediate school. Perhaps the chart is "flagged" in high school; most likely it ends there.

Unfortunately, such a long, ongoing, multidisciplinary management of these problem children would require no less than a social upheaval—nonetheless, a start would be a start. Every journey has a beginning.

I need to make the reader aware that some segments of this article are of biographical origin; other segments come *from my own pocket.* In retrospect, there is little doubt that I had a then-unrecognized ADHD without LD. Reaching further back, the etiology could well have been a mild encephalitis accompanying the Spanish influenza which at that time was striding with cruel feet across the world. The possible effects of this remain in my pocket.

Brief and unannotated bibliography

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